What is claimed is

1. A method of forming a trench isolation structure, comprising:

providing a substrate having a trench;

forming a polysilicon liner in said trench; and

forming a dielectric layer in said trench upon said polysilicon liner.

2. The method of claim 1, wherein said polysilicon liner has a thickness of about 50-150 angstroms.

3. The method of claim 1, wherein said dielectric layer comprises a layer of spin-on glass.

4. The method of claim 1, wherein said step of forming said dielectric layer comprises:

coating a spin-on glass over said substrate;

performing a chemical mechanical polishing on said spin-on glass;

annealing said spin-on glass; and

etching back said spin-on glass to form a recess.

5. The method of claim 4, wherein said polysilicon liner is converted into an oxide layer during said annealing step.

6. The method of claim 4, further comprising a step of baking said spin-on glass after said coating step.

7. The method of claim 4, further comprising a step of forming a filled dielectric layer in said recess upon said spin-on glass.

8. The method of claim 7, wherein said filled dielectric layer comprises a high density plasma (HDP) oxide layer.

9. A method of forming a trench isolation structure, comprising:

providing a substrate having a trench;

forming a polysilicon liner in said trench;

forming a spin-on glass in said trench upon said polysilicon liner; and

annealing said spin-on glass.

10. The method of claim 9, wherein said polysilicon liner has a thickness of about 50-150 angstroms.

11. The method of claim 9, wherein said polysilicon liner is converted into an oxide layer during said annealing step.

12. The method of claim 9, wherein said step of forming said spin-on glass comprises:

coating said spin-on glass over said substrate;

baking said spin-on glass;

performing a chemical mechanical polishing on said spin-on glass; and

etching back said spin-on glass to form a recess.

13. The method of claim 12, further comprising a step of forming a filled dielectric layer in said recess upon said spin-on glass.

14. The method of claim 13, wherein said filled dielectric layer comprises a high density plasma oxide layer.

15. A trench isolation structure in a semiconductor substrate, comprising:

a trench formed in said semiconductor substrate;

a polysilicon liner arranged upon sidewall surfaces and a base surface of said trench;

a spin-on glass arranged within said trench upon said polysilicon liner; and

a filled dielectric layer arranged within said trench;

wherein said spin-on glass is interposed between said polysilicon liner and said filled dielectric layer.

16. The trench isolation structure of claim 15, wherein said filled dielectric layer comprises a high density plasma oxide layer.

17. The trench isolation structure of claim 15 further includes an oxide layer converted from said polysilicon liner.